

Remarks

By the foregoing amendment, claims 17-23 and 25-31 have been amended, and new claims 32-34 have been added. Applicants respectfully submits that no new matter was added by the amendment, as all of the amended matter was either previously illustrated or described in the drawings, written specification and/or claims of the present application. Entry of the amendment and favorable consideration thereof is earnestly requested.

Objections to Specification

The Examiner objected to the specification as not having the preferred layout pursuant to 37 CFR 1.77 (b). In response, Applicants amended the specification to insert the proper headings as suggested by the Examiner.

With respect to the Examiner's objection to Figures 12 and 13 as not being listed in the list of drawings, Applicants respectfully submit that the present application contains Figures 1-11 only. It appears that the Examiner misinterpreted drawing sheets designations as figure numbering. If that is not the case, Applicants would appreciate further clarification of this objection.

Accordingly, Applicants respectfully submit that the above objections to the specification be withdrawn.

Objections to Drawings

The Examiner has objected to drawings as not showing every feature of the invention specified in the claims. Specifically, the Examiner has stated that the features, which perform the following functions, are not shown in the drawings: “detecting grid malfunction,” “monitoring temperature,” “comparing temperatures,” and “controlling wind turbine blades.”

In response, Applicants respectfully submit that the claimed features discussed by the Examiner are sufficiently illustrated in the figures, and therefore no new drawings are required. For example, Fig. 5 illustrates a pitch regulating system 15, which performs the function of controlling wind turbine blades, and a detection system 11 for detecting grid malfunction and disconnecting grid switches, also shown in Fig. 6. Page 12 of the specification discusses that the temperature of various components of the wind turbine, e.g. gear means 6, a generator 7, a frequency converter 17, and a transformer 12, may be measured by temperature sensors positioned in critical places on the components. The measured temperature values are then transferred to the control system 16 via connections 23a, and the control system 16 then compares the collected values and predefined limit values.

Accordingly, it is respectfully requested that the objections to the drawings be withdrawn.

Claim Rejections – 35 USC §112

The Examiner has rejected claims 17-31 under 35 U.S.C. §112, second paragraph, as being indefinite. Specifically, the Examiner has rejected claims 17, 25, 30 and 31 as being incomplete for omitting essential structural cooperative relationships of elements.

With respect to claim 17, the Examiner has stated that the phrases “a malfunction of said utility grid,” “determining the malfunction,” “monitoring temperature,” “comparing said temperature,” and “controlling one or more wind turbine blades” are not supported by any structure, which makes the claims indefinite and/or structurally undetermined. Applicants have amended claim 17, as well as other claims, to better define the structural features of the present invention. The necessary support for the amendment may be found at least on pages 12, 13 and 16 of the specification, and in Figs. 5 and 6.

Additionally, with respect to claims 17-22 and 25-31, the Examiner has objected to the use of the term “or” as rendering the scope of the claims unascertainable. In response, Applicants amended the above claims to delete the term “or.”

With respect to claims 30 and 31, the Examiner has asserted that the words “at least one predefined limit” are not defined by any language, which makes the claimed “limit” ascertainable. Applicants respectfully disagree and submit that the “at least one predefined limit” limitation clearly refers to a critical temperature level at which the wind turbine components may become harmed. Such level may be predefined via recommendations provided by the component manufacturer.

The Examiner has also asserted that the words “comparison of said temperature” has no structural support for performance of such function. Applicants respectfully submit that claims 30 and 31 recite “a control system for comparison of said temperature...,” which makes it clear that the comparison of the temperatures is performed by the control system. Applicants also amended claims to recite “a comparator for comparison of said temperature” to further clarify this feature of the present invention.

Accordingly, it is respectfully requested that the above rejections be withdrawn.

Claim Rejections – 35 USC §103(a)

The Examiner has rejected claims 17-31 under 35 U.S.C. §103(a) as being obvious over WPO 03/058789 (hereinafter “WO’789”) in view of DE 3342 583 (hereinafter “DE’583”). Applicants respectfully request the Examiner to reconsider these rejections in view of the below Remarks.

The present invention, as recited in claims 17, 25, 30 and 31, is directed to a system and method of controlling a wind turbine connected to an electric utility grid during malfunction in the electric utility grid. The method includes detecting a malfunction in the electric utility grid via at least one detector, monitoring temperature in at least one of a stator, a rotor of the generator, semiconductors of electric control systems, a transformer and gear means of the wind turbine via at least one sensor, comparing the temperature with at least one predefined limit via a comparator, and controlling at least one wind turbine blade of the wind turbine via at least one control mechanism in order to

keep the temperature below at least one predefined limit in a time period of the malfunction.

WO'789 discloses a wind turbine with an electric generator connected to a utility grid. An electrical transient detection device (4) of the wind turbine is used in detecting a transient fault situation in the utility grid. Separate current limiters (6) are activated by the wind turbine controller (5) in order to limit any excess transient current after having detected the transient. The limiters may be impedances (7) connected in series with the power grid (3). (See Fig. 1; page 3, lines 16-31).

However, WO'789 fails to disclose a method of controlling internal components of a wind turbine during the transient situation, but instead teaches the use of separate components – current limiters – added to the wind turbine for this situation only. Further, as acknowledged by the Examiner, WO'789 does not disclose a method of controlling the wind turbine in response to monitoring of any internal component value, such as temperature. (Office Action, p. 6). Accordingly, because WO'789 does not disclose monitoring temperature in at least one of a stator, a rotor of the generator, semiconductors of electric control systems, a transformer and gear means of the wind turbine via at least one sensor, comparing the temperature with at least one predefined limit via a comparator, and controlling at least one wind turbine blade of the wind turbine via at least one control mechanism in order to keep the temperature below at least one predefined limit in a time period of the malfunction, the present invention is novel and patentable over this reference.

DE'583 discloses a control system for a wind power generating system connected to loads directly or via a utility grid. DE'583 generally suggests that the control system may monitor temperature of the generator and control the power output as a function of the temperature. However, the control system disclosed in DE'583 is very different from the system of the present application, and is clearly incapable of controlling a wind turbine connected to an electric utility grid during malfunction in the electric utility grid, including detecting a malfunction in the electric utility grid via at least one detector.

The Examiner has asserted that it would have been obvious to one of skill in the art to modify the wind turbine generation system as taught by WO'789 to add temperature monitoring and controls based on such monitoring as taught by DE'583. Applicants respectfully disagree. If a person of ordinary skill in the art were looking to improve the control system disclosed in WO'789 to achieve a solution to the ever-increasing power generation of modern wind turbines, he/she would have been motivated to add more impedances to the separate current limiter system and/or try to improve the switching of the impedances, as taught by WO'789, and would not look any further. Additionally, Applicants submit that one of skill in the art would never look to the teachings of DE'583 in order to improve the system disclosed in WO'789 because DE'583 does not relate to wind turbines that remain connected to the utility grid and are controlled during a grid malfunction. Further, one of ordinary skill in the art would never look to the teachings of DE'583 in order to improve the system of WO'789 because at the time DE'583 was filed, the common knowledge in the art was that wind turbines are small and insignifi-

cant power suppliers, capable of being quickly disconnected from the utility grid if a malfunction occurred in the utility grid.

Accordingly, a person of skill in the art would never have been motivated to combine the teaching of the separate impedance solution in a modern wind turbine as disclosed in WO'789 with the outdated solution of DE'583, and thus would not arrive at the invention, as claimed. Therefore, it is respectfully submitted that the invention is both novel and non-obvious in view of the cited prior art references.

Conclusion

For the foregoing reasons, Applicants respectfully submit that all pending claims, namely claims 17-34, are patentable over the references of record and earnestly solicit allowance of the same.

Respectfully submitted,

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